# ORDEAUX SPRAY FOR TRUCK CROPS

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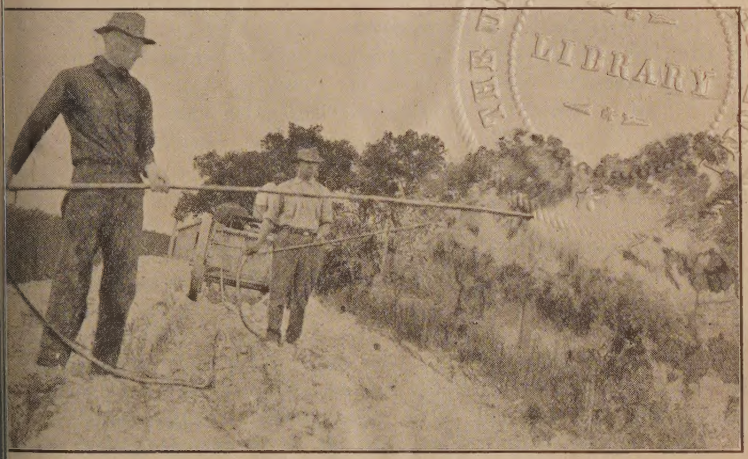

INSURING THE GRAPE CROP AGAINST ROT

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# BORDEAUX SPRAY FOR TRUCK CROPS

G. W. Fant, *Extension Plant Pathologist.*

Bordeaux mixture is the most effective and economical spray for con-
ol of diseases of truck crops. At the present time, it is used for this
irpose over most of the country and has been demonstrated to be
ofitable when applied in the correct manner. This spray was dis-
vered to be of value for the control of plant diseases in 1882, and up
til the present time no spray material has been prepared which is
ore effective in combating infectious diseases of truck crops.

Home-made Bordeaux mixture has been found to be more economical
r vegetables, as a rule, than the commercial spray materials on the
arket. It is also equally effective for disease control as the com-
ercial mixtures. It is strongly recommended for the grower who has
extensive area of vegetables to spray. By making use of stock solu-
ons as described herein, the trouble of making Bordeaux is reduced to a
inor factor, and the home preparation of this spray will be found no
ore difficult than the mixing of any other spray material.

The copper-lime dusts which are being used in some sections are simi-
r in nature to Bordeaux mixture as regards their chemical make-up;
t it is still somewhat questionable as to whether the dusts are as
fective for disease control as the Bordeaux mixture spray itself.

## How Bordeaux is Prepared.

Bordeaux mixture is a spray easily prepared, and is made from mate-
ials usually obtainable by the grower. The method of preparation illus-
rated by Fig. 1 on page 5 is as follows:

(1) Place 4 pounds of copper sulphate (bluestone) in a small cheese-
loth bag and suspend it to dissolve in a wooden keg or barrel in which
as been placed 25 gallons of water. Do not use metal containers for
his purpose.

(2) Slack 5 pounds of good quality stone lime in a wooden container
lowly with water, without allowing the lime to burn, until it reaches
creamy, well-slacked consistency. When the slacking is over, dilute
o as to make up to 25 gallons, and strain through a wire or cheese-
loth strainer. The copper sulphate solution and the lime must be kept
eparate until this stage in the preparation has been reached.

(3) Pour the two solutions together, while stirring thoroughly, into
larger barrel or the spray tank, if the latter holds 50 gallons. It is
mportant that the mixture be properly strained, as large particles will
ause clogging of the spray nozzles.

The 4-5-50 formula Bordeaux mixture may be prepared in such qu tities as to meet the needs of the grower. If, for instance, smaller qu tities than 50 gallons are needed, use a 2-2½-25, a 1-1¼-12½ form or still smaller quantities of the same proportion.

Bordeaux mixture, generally speaking, controls disease only, tho it acts as a repellant for certain insects. In order to control chew insects, such as the potato beetle or the striped cucumber beetle, arsenate of lead in quantities as given herein under the heading of various crops. This arsenate should be stirred in thoroughly so a get the material evenly distributed. For sucking insects, such as pl lice, add from one-quarter to one-half pint of a 40 per cent nico preparation to each 50 gallons of spray.

After the copper and lime solutions have been mixed, the spray m rial should not be kept for more than a day before being applied, cause it deteriorates rapidly with age. Stock solutions can be prepa however, which will keep indefinitely.

### Stock Solutions.

By making use of stock solutions, Bordeaux can be prepared by mer diluting given quantities of the two constituent solutions and then po ing the two together. This is especially convenient where several sp applications are to be made at intervals throughout the season. St solutions are prepared by dissolving the copper sulphate at the rate one pound to one gallon of water; and in the case of the lime st solution, using one gallon of water for each pound of lime. The t solutions are kept separate and are best stored away in covered stone glass containers. In order to prevent them from becoming too str through evaporation, it is a good plan to mark the height at which liquid stands in the container after each use, and then before us again to replace the water lost by evaporation. When prepared in t way one gallon of stock solution represents one pound of the mate which it contains. When ready to make up a quantity of spray ma rial, stir and measure off the desired amount of stock solution fr each container. As previously mentioned, these must be diluted se rately before they are mixed. If, for instance, 50 gallons of spray to be made up, take 4 gallons of the bluestone solution and dilute to gallons with water. Do the same with 5 gallons of the lime soluti Then pour the two together.

The quantity of stock solution to make up will, of course, depend up the amount of spray which will be needed. If, for instance, it is es mated that 200 gallons of spray will be needed during the season, ma up 16 gallons of copper sulphate stock solution and 20 gallons of li solution. These will be sufficient for making the 200 gallons of spr

### Spray Injury to Foliage.

rdeaux is often made by mixing the materials at the rate of unds of bluestone, 4 pounds of lime to 50 gallons of water, or 4 ds of bluestone, 4 pounds of lime to 50 gallons of water. Cer- crops, however, (such as the apple in summer) are at times injured ıe 4-4-50 formula, and in order to eliminate this danger a mixture bstituted containing a greater amount of lime. Burning is due to ime being present in an insufficient quantity, or its being of too quality to properly neutralize excess copper, which does the burn- *(Never spray peaches or plums with Bordeaux mixture. The ge is too susceptible to burning to be treated safely with this mate-*

### To Test the Strength of Bordeaux.

is often convenient to test Bordeaux mixture for excess copper in to make sure that burning will not result. Either of the two ods given below may be followed:

) If a clean and bright knife blade is held in the Bordeaux mixture ı minute or so without becoming coated with copper, sufficient is present. If copper appears on the blade, more lime should be d.

) The mixture may be tested with potassium ferrocyanide (yellow ıiate of potash) (POISON). Using a glass bottle, dissolve one e of the chemical in five times this quantity of water, by weight. e a small quantity of Bordeaux mixture in a shallow dish. Add a drops of the potassium ferrocyanide solution. If a dirty brown loration appears more lime should be used. If not, the Bordeaux operly made.

### Crops Sprayed with Bordeaux Mixture.

low is given a list of crops commonly sprayed with Bordeaux mix- with the diseases controlled in each instance:

*ish Potatoes.*—Early and late blight. Begin spraying when plants our or five inches high and continue at from ten to fifteen-day in- ls. For potato beetles, add 1½ to 2 pounds of arsenate of lead ler or from 3 to 4 pounds of arsenate of lead paste to each 50 gallons ray. In general, three or four sprayings per season will be found table.

*atermelons, Muskmelons, and Cucumbers.*—Downy mildew, leaf , and melon anthracnose. Make first spray application about the the vines begin to run; spray again one week after fruit begins to nd third, about two weeks after second spray. For striped beetles, 2 pounds of arsenate of lead powder to each 50 gallons of spray.

*matoes.*—Early blight, late blight, leaf spot, and most fruit rots. e application at first signs of disease and continue at two-week in- ls.

*Celery.*—Leaf-spot diseases. When disease is sufficiently seve warrant it, spray the plants in the plant bed and again as soon as t become established in the field. Repeat thereafter often enough to new growth of leaves covered, usually about every two weeks.

*Beans.*—Anthracnose. If troubled with this disease, which pro circular pink spots with smooth margins, begin spraying whe plants are three or four inches high, and continue at from ten-d two-week intervals until the pods are formed.

*Raspberries and Blackberries.*—Leaf and cane anthracnose and t leaf diseases. Make applications every ten days or two weeks if h troubles appear.

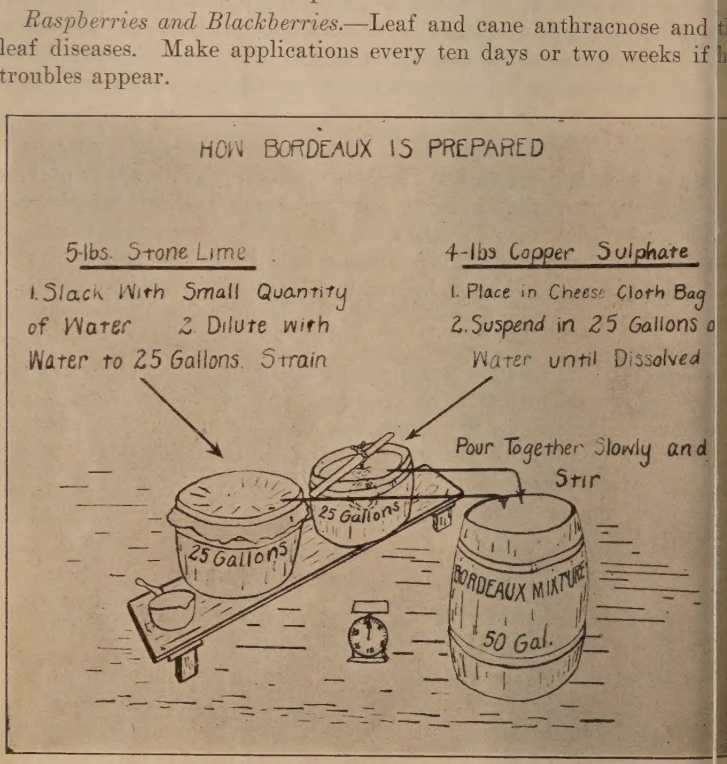
HOW BORDEAUX IS PREPARED
5-lbs. Stone Lime
1. Slack With Small Quantity of Water 2. Dilute with Water to 25 Gallons. Strain
4-lbs Copper Sulphate
1. Place in Cheese Cloth Bag
2. Suspend in 25 Gallons o Water until Dissolved
Pour Together Slowly and Stir
25 Gallons
25 Gallons
BORDEAUX MIXTURE
50 Gal.

Fig. 1. Diagram Illustrating the Preparation of Bordeaux Mixtu

*Grapes.*—Fruit rots and foliage diseases. Spray first with com cial lime sulphur 1-8 when buds begin to swell. Second, with Bord when third leaf forms on shoots; third, with Bordeaux before the soms begin to open; fourth, with Bordeaux just after the blossoms and later at ten to fifteen-day intervals, depending upon weather c tions. Arsenate of lead should be added for chewing insects, begin with the second application, at the rate of one pound to 50 gallo spray. For leaf hoppers, add one-fourth pint of 40 per cent nicoti 50 gallons of spray.

## How Bordeaux is Applied.

or the small garden, small atomizers in which the liquid is carried n attached quart jar may be found satisfactory. They, however, not substantial and do not last for any considerable length of time. pressed air sprayers, like that shown in Fig. 2, will be found con- ent for the garden or the slightly larger truck area. It is advisable these compressed air outfits be made of brass, because Bordeaux ture and other spray materials attack tin and iron. While good yers are somewhat expensive, the more substantial and costly ones the most economical in the long run.

Fig. 2. A Good Sprayer for the Small Truck Area

Where the area is from one to several acres, and where fruit trees are to be sprayed, a barrel sprayer is sometimes found to be a suitable fit. The spray pump and extension leads can be purchased for at- hment to a 50-gallon barrel, which the grower may supply himself. ese barrel sprayers are conveniently carried about the field on two- eeled carts.

For the larger areas, traction sprayers are commonly in use. develop good pressure and will spray large areas in a day. Adju spray booms are employed, which spray several rows at the same and which may be set for varying width of rows, depending upo crop. Some growers on the larger truck farms employ sprayers develop their pressure from gasoline engines. These are not ess for vegetable spraying, as a rule, since horse-drawn traction spr are now being manufactured which develop sufficient power to satisfactorily spray large areas.